



Municipal solid waste management system through geographical information

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Received: 02-Dec-2022, Manuscript No. GJGG-22-84807; **Editor assigned:** 05-Dec-2022-PreQC No. GJGG-22-84807 (PQ); **Reviewed:** 20-Dec-2022, QC No. GJGG-22-84807; **Revised:** 26-Dec-2022, Manuscript No. GJGG-22-84807 (R); **Published:** 03-Jan-2023, DOI: 10.15651/2449-1861.23.10.013

DESCRIPTION

Municipal solid waste management is a non-profitable field and requires a lot of resources to collect waste from each household in the urban area and dispose of them to an appropriate place. Cities are expanding day by day due to rapid growth in population. Therefore, there is an expansion in residential, commercial and industrial land uses leading to the generation of an enormous quantity of MSW. There are improper allocation and distribution of MSW collection points, leading to negative setbacks that require immediate attention. Due to this a lot of unauthorized refuse points have been created, especially near the main roads. It turned the gutters, drainage, roadside areas as refused collection points that caused the area flooded during the rainy season.

There are some methods for MSW management, i.e., traditional methods and information system based methods. In conventional methods, required data preparation and all its analysis cannot be performed on the same platform and there is lack of proper information about the municipal area such as road network, traffic flow on the road network, number and size of various vehicles allotted to a specific area. Therefore, the existing system of the waste collection system is highly inefficient in most of the metropolitan cities. In warrants an urgent need to develop a Geospatial database (GIS database) from primary and secondary data sources for the MSW management. In some of the cities, GIS database is generated using standalone desktop GIS software. A desktop GIS helps in database development and analysis, but for sharing data and information, there is a need to develop a web-based GIS.

Identification of the location of bins and dumping sites with the pace of expansion of the city. Monitoring the status of the cleanliness of the city for improvement of the current status of the city and human experience. The data required for the development of information systems for the MSW management system can be classified as spatial

and non-spatial data. The spatial and attribute (non-spatial) data constitute the development of a GIS-based system for MSW. GIS is one of the information technologies that are used to solve problems in various areas. Goodchild defined GIS is a computer system for capturing, storing, checking and displaying data related to position on the earth's surface. GIS can show a different kind of data on one map. GIS enables people to more easily visualize, analyze and understand patterns and relationships.

A geographical information system is a multidisciplinary field that deals with a different set of data. These data set may be obtained from maps, charts, text, aerial photographs, satellite images and survey/ground information. The management and analysis of geographic data (spatial data) require a computer-based system called Geographical Information System(GIS). GIS is used for solving complex geographical and planning problems. Data may be integrated and then a set of georeferenced layers can be analyzed independently or in combination. In MSW management, GIS is used as a spatial data development and decision tool. GIS provides the capability of modeling activities that increase the decision quality through maps.

CONCLUSION

Maps provide a clear visualization of results. These modeling and visualization capabilities are fundamental tools of GIS contributing to comprehend the processes. GIS is often called Desktop GIS. A desktop GIS helps in the integration of MSW spatial data such as the location of bins, ward boundary, geographic location and the boundary of the study area and geographic location of dumping sites, etc. with its non-spatially information (attribute data) which increase the overall utility of MSW data. A desktop GIS helps in database development and analysis in a single system but has a limitation in sharing data and information to different users due to the absence of a suitable wide network.